

WHAT IS CLAIMED IS:

1. A method of providing voice grade telephone service to a plurality of subscribers using existing telephone loop facilities, comprising the steps of:

configuring said telephone loop facilities to provide plural digital subscriber line (DSL) services between a telephone facility and a remote facility using respective DSL circuits;

assigning a plurality of subscriber lines to each of said DSL circuits;

routing calls terminating at a central office to an associated one of said DSL circuits;

transmitting calls on said DSL circuits to respective Packet Voice Devices (PVDs) located at said remote facility;

completing calls from said PVDs to nearby ones of said subscribers over respective copper loop facilities connecting said PVDs to telephone equipment of said subscribers.

2. The method of claim 1 further comprising the step of supplying power to said PVDs independent of a local commercial power source.

3. The method of claim 1 further comprising the step of installing said DSLs at offsite locations near respective groups of said subscribers being served by said DSLs.

4. The method of claim 1 further comprising the step of installing said DSLs at one or more remote DSLAM Terminals, which in turn supply Serving Area Interfaces (SAIs).

5. The method of claim 1 further comprising the step of installing said DSLs at distribution cable interface ends of respective drop wires wherein opposite ends of said drop wires are connected to subscriber network interface devices (NIDs) located on the premises of respective ones of said subscribers.

6. In an existing switched telephone network comprising a plurality of central offices connected by interoffice facility trunks, each central office providing service to nearby subscribers connected by local loop facilities, the local loop facilities including a feeder

distribution system connecting the central offices to respective serving area interfaces and local drops connecting respective subscribers to said serving area interfaces, a method of expanding the capabilities of the feeder distribution to accommodate additional subscribers, comprising the steps of:

configuring said feeder/distribution system to provide plural digital subscriber loops (DSL) between said central offices and said serving area interfaces using respective DSL circuits;

terminating said DSL circuits at respective PVDs located at remote DSLAM terminals; and

assigning a plurality of subscriber lines to each of said DSL circuits.

7. The method according to claim 6 further comprising the steps of:

routing calls terminating at a central office to an associated one of said DSL circuits;

transmitting calls on said DSL circuits to respective Packet Voice Devices (PVDs) located at said remote facility;

completing voice calls from said PVDs to nearby ones of said subscribers over respective copper loop facilities connecting said PVDs to telephone equipment of said subscribers.

8. The method according to claim 6 further comprising the steps of:

detecting an off-hook condition present on one of said local drops;

transmitting dial tone from said central office to said local drop via an associated one of said DSL circuits;

collecting dialed digits at said central office, dialed digits received from said local loop and transmitted to said central office by way of said associated one of said DSL circuits; and

completing a voice call to a telephone number corresponding to said dialed digits.

9. The method according to claim 8 wherein said steps of transmitting includes in-band signaling using said associated one of said DSL circuits, and said completing step

includes establishing a full-duplex voice circuit also using said associated one of said DSL circuits.

~~10.~~ A telephone system comprising:
network switching facilities including
(i) a digital switch providing telephone service to a plurality of subscribers,
(ii) a digital subscriber line access multiplexer (DSLAM) connected to said voice switch;
local loop transmission facilities connected to said DSLAM; and
a PVD connected (a) to said DSLAM via said local loop transmission facilities and
(b) to a plurality of copper loops, each of said copper loops terminated at respective network interface devices (NIDs) associated with respective ones of said subscribers for providing voice telephone service to said subscribers.

11. The telephone system according to claim 10 wherein said digital switch comprises one of a packet and voice switch.

12. The telephone system according to claim 10, further comprising a power supply connected to said local loop transmission facilities and supplying electric operating power thereover to said PVD.

13. The telephone system according to claim 10 wherein digital switch includes (i) a digital interface connected to said DSLAM, and (ii) a plurality of line cards connected to provide telephone service to another plurality of subscribers.

14. The telephone system according to claim 13 wherein said network switching facilities further include a main distribution frame (MDF) connected to said local loop transmission facilities to transmit signals (i) between said DSLAM and said copper loop transmission facilities and (ii) between said line cards and other copper loop facilities associated with said another plurality of subscribers.

15. The telephone system according to claim 10 further comprising a packet switch connecting said DSLAM to said digital switch.

16. The telephone system according to claim 10 wherein said PVD further comprises a weatherproof outdoor enclosure having mounted therein a plurality of line modules connected to corresponding copper loops, each of said copper loops extending and connecting to a corresponding one of said subscribers.

17. The telephone system according to claim 16 wherein said DSLAM is connected to said digital switch by way of a fiber optic cable.

18. The telephone system according to claim 17 further comprising a main distribution frame and multi-line protector block.

19. The telephone system according to claim 18 further comprising a Digital Loop Carrier (DLC) system connected to and sharing said fiber optic cable, said network switching facilities further including an optical add/drop multiplexer (ADM)/Central Office Terminal (COT) and a digital cross connect configured to connect said DLC to said digital switch.

20. The telephone system according to claim 19 wherein said DSLAM and PVD receive uninterrupted, battery back-up power independent of a commercial power sources providing power to said subscribers.

21. The telephone system according to claim 10 wherein said PVD is mounted at a distribution cable termination site; aerial, buried, underground or building terminal and is connected to a plurality of subscriber network interfaces via respective drop wires.

22. The telephone system according to claim 10 wherein said digital switch includes a switch module (SM) including a plurality of analog POTS line cards having associated therewith ones of said subscribers.